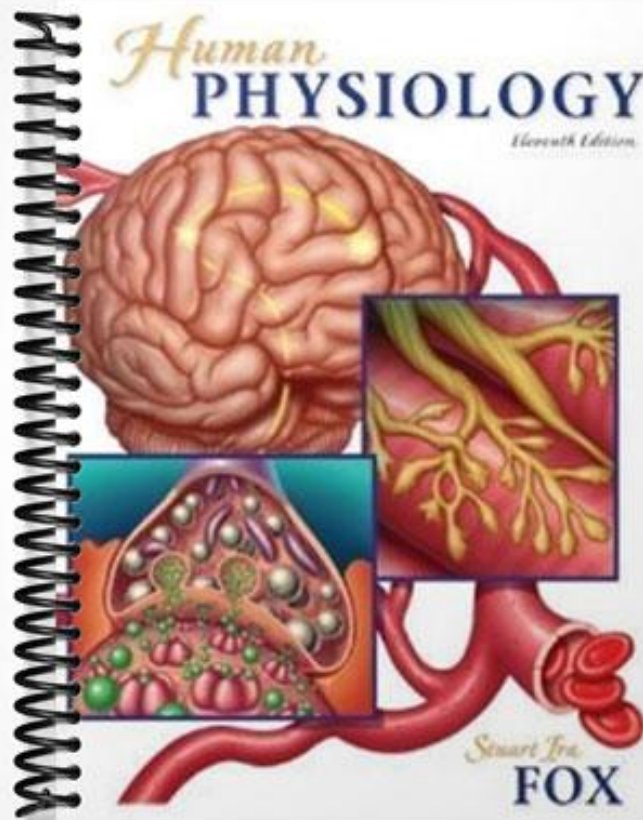


SOLUTIONS MANUAL



Chapter 02 Chemical Composition of the Body

Multiple Choice Questions

1. Water makes up _____ of the total body weight of an average adult.
- A. 50-60%
 - B. 55-65%
 - C. 60-70%
 - D.** 65-75%

Bloom's: Remembering

2. Most of the water found in the body is in the
- A. blood.
 - B.** intracellular fluid compartment.
 - C. extracellular fluid compartment.
 - D. blood and extracellular fluid compartment.

Bloom's: Remembering

True / False Questions

3. Neutrons are uncharged particles found in the nucleus of an atom.
- TRUE**

Bloom's: Remembering

4. An element with 5 protons, 5 neutrons, and 5 electrons would have an atomic number of 15.

FALSE

Bloom's: Applying

Multiple Choice Questions

5. The atomic nucleus does not contain _____, which are negatively charged subatomic particles.

A. protons

B. electrons

C. neutrons

Bloom's: Remembering

6. An element with 11 neutrons, 11 protons, and 11 electrons would have an atomic mass of _____.

A. 11

B. 33

C. 22

D. cannot be determined

Bloom's: Applying

7. The _____ is the physical space which an electron occupies in an atom.

A. nucleus

B. orbital

C. energy level

D. Both orbital and energy level are correct.

Bloom's: Remembering

8. The _____ electrons are the outermost electrons of an atom.

- A. kernel
- B. valence**
- C. atomic
- D. anion

Bloom's: Remembering

9. Isotopes have the same _____ number, but a different _____ number.

- A. mass, atomic
- B. neutron, mass
- C. atomic, mass**
- D. atomic, proton

Bloom's: Remembering

10. Which of the following is NOT true of isotopes of a given atom?

- A. have the same number of neutrons**
- B. have the same number of protons
- C. have different atomic masses
- D. All of these choices are correct.

Bloom's: Remembering

True / False Questions

11. The term "chemical element" refers to the most common isotope of that element.

FALSE

Bloom's: Remembering

Multiple Choice Questions

12. Which of the following subatomic particles have negligible mass?

- A.** electrons
- B. neutrons
- C. protons
- D. Both neutrons and protons.

Bloom's: Remembering

True / False Questions

13. Molecules with polar covalent bonds are hydrophilic.

FALSE

Bloom's: Remembering

14. Negatively charged ions will migrate toward the anode in an electrical field.

FALSE

Bloom's: Understanding

15. Hydrogen bonds form between the partially charged atoms of two polar molecules, such as the slightly negatively charged hydrogen atom of one water molecule and the slightly positively charged oxygen atom of another.

FALSE

Bloom's: Understanding

16. Atoms sharing a pair of electrons form covalent bonds.

TRUE

Bloom's: Remembering

Multiple Choice Questions

17. When an atom loses one or more electrons, it
A. becomes positively charged.
B. becomes negatively charged.
C. is called an anion.
D. has no change in its charge.

Bloom's: Understanding

18. When an atom gains one or more electrons, it
A. becomes positively charged.
B. has no change in its charge.
C. is called an anion.
D. is called a cation.

Bloom's: Remembering

19. An atom with 5 protons, 5 neutrons, and 6 electrons would have a net charge of
A. -1.
B. -2.
C. +1.
D. +2.

Bloom's: Understanding

20. _____ bonds are formed when atoms share electrons unequally.
A. Nonpolar covalent
B. Ionic
C. Polar covalent
D. van der Waals

Bloom's: Remembering

21. Hydration spheres can be formed by compounds which contain _____ bonds.
- A. nonpolar covalent
 - B. polar covalent
 - C. ionic
 - D. either polar covalent or ionic**

Bloom's: Understanding

22. Hydrophobic molecules would contain _____ bonds.
- A. nonpolar covalent**
 - B. polar covalent
 - C. hydrogen
 - D. ionic

Bloom's: Understanding

23. Surface tension between water molecules occurs because adjacent water molecules form _____ bonds with each other.
- A. nonpolar covalent
 - B. polar covalent
 - C. hydrogen**
 - D. ionic

Bloom's: Remembering

24. Bonds that are formed between oxygen and hydrogen atoms within water molecules are called _____
- A. hydrogen bonds.
 - B. ionic bonds.
 - C. nonpolar covalent bonds.
 - D. polar covalent bonds.**

Bloom's: Remembering

25. The type of bond found in sodium chloride is
A. an ionic bond.
B. a polar covalent bond.
C. a hydrogen bond.
D. a nonpolar covalent bond.

Bloom's: Understanding

26. Which of the following would be most easily broken?
A. a hydrogen bond
B. a nonpolar covalent bond
C. an ionic bond
D. a polar covalent bond

Bloom's: Understanding

True / False Questions

27. The pH of a solution is directly proportional to the hydrogen ion concentration of the solution.
FALSE

Bloom's: Understanding

28. Acids release hydrogen ions into solutions.
TRUE

Bloom's: Remembering

29. As the pH of the blood decreases, the amount of hydrogen ions in the blood would decrease.

FALSE

Bloom's: Understanding

Multiple Choice Questions

30. Water molecules form _____ ions when they associate with a hydrogen ion.

- A. hydroxide
- B. bicarbonate
- C.** hydronium
- D. water

Bloom's: Remembering

31. A solution of a pH above 7 is called _____.

- A. acidic
- B. neutral
- C.** basic

Bloom's: Remembering

32. Bases will _____ protons in a solution.

- A.** accept
- B. donate
- C. ignore
- D. repel

Bloom's: Remembering

33. The primary buffer in the blood is the _____ buffer.
- A. hydronium
 - B. ammonia
 - C. phosphate
 - D. bicarbonate**

Bloom's: Remembering

34. The pH of a solution increases as the _____ ion concentration decreases.
- A. hydrogen**
 - B. hydroxide
 - C. bicarbonate
 - D. sodium

Bloom's: Understanding

35. In an acidic solution,
- A. the OH^- ion concentration is greater than the H^+ ion concentration.
 - B. the OH^- ion concentration is less than the H^+ ion concentration.**
 - C. the H^+ ion concentration is equal to the OH^- ion concentration.
 - D. the H^+ ion concentration is less than the OH^- ion concentration only if the solution is buffered.

Bloom's: Understanding

36. A blood pH of 7.6 is
- A. indicative of acidosis.
 - B. indicative of alkalosis.**
 - C. in the normal physiological range.
 - D. indicates effective buffering by the bicarbonate/carbonic acid system.

Bloom's: Understanding

37. Regarding acids and bases,
- A. acids will increase the pH of a solution.
 - B. bases will decrease the pH of a solution.
 - C. acids will accept hydrogen ions in a solution.
 - D.** bases will accept hydrogen ions in a solution.

Bloom's: Understanding

38. Ammonia usually
- A.** acts as a base.
 - B. acts as an acid.
 - C. acts as a buffer.
 - D. ionizes to form a hydroxyl ion.

Bloom's: Remembering

True / False Questions

39. Organic acids contain carbonyl groups.
FALSE

Bloom's: Remembering

Multiple Choice Questions

40. Molecules that contain carbon and hydrogen atoms are
- A. ionic.
 - B. inorganic.
 - C.** organic.
 - D. carbonic.

Bloom's: Remembering

True / False Questions

41. Only L-stereoisomers are absorbed by the digestive tract and used to synthesize organic molecules.

FALSE

Bloom's: Understanding

42. An ionized organic acid is designated with the suffix-ate.

TRUE

Bloom's: Remembering

43. The ionized form of the organic lactic acid is lactate.

TRUE

Bloom's: Understanding

Multiple Choice Questions

44. _____ are molecules with the same ratio of atoms but different arrangements of atoms.

A. Isotopes

B. Structural isomers

C. Stereoisomers

D. Radioactive isotopes

Bloom's: Remembering

Chapter 02 - Chemical Composition of the Body

45. How many single bonds can a carbon atom form if it is double-bonded to an oxygen atom?

- A. 1
- B. 2**
- C. 3
- D. 4

Bloom's: Applying

46. A six-sided organic molecule with alternating double bonds is termed a(n)

- A. aromatic compound.**
- B. ketone.
- C. alcohol.
- D. organic acid.

Bloom's: Remembering

47. Ketones contain a(n) _____ group within the carbon chain.

- A. hydroxyl
- B. carbonyl**
- C. carboxyl
- D. aromatic

Bloom's: Remembering

48. Organic acids will contain

- A. a carboxyl group.**
- B. a carbonyl group.
- C. an amino group.
- D. a hydroxyl group.

Bloom's: Remembering

49. An example of an aromatic substance is
- A. hexane.
 - B. cyclohexane.
 - C. fructose.
 - D.** benzene.

Bloom's: Remembering

True / False Questions

50. Fats and carbohydrates are the primary energy stores in the body.
TRUE

Bloom's: Remembering

51. Glucose, galactose, and fructose can be considered structural isomers of each other.
TRUE

Bloom's: Understanding

52. Fructose is a ketone.
FALSE

Bloom's: Remembering

53. Covalent bonds are formed between monosaccharides through dehydration synthesis.
TRUE

Bloom's: Remembering

Multiple Choice Questions

54. The addition of water with the proper enzymes to a molecule is called

A. dehydration synthesis.

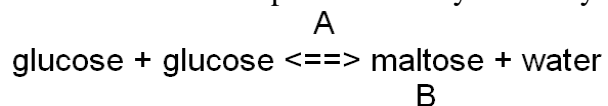
B. condensation.

C. hydrolysis.

D. combustion.

Bloom's: Remembering

55. Which reaction represents a dehydration synthesis reaction?



A. Reaction A

B. Reaction B

Bloom's: Understanding

True / False Questions

56. Carbohydrate molecules have a ratio of twice as many oxygen atoms to carbon atoms.

FALSE

Bloom's: Remembering

Multiple Choice Questions

57. Sucrose is a disaccharide that is composed of _____ and _____.
- A. glucose, glucose
 - B. glucose, galactose
 - C. glucose, fructose**
 - D. fructose, galactose

Bloom's: Remembering

58. Glycogen
- A. is more highly branched than plant starch.**
 - B. is a glycoprotein found in the liver.
 - C. is a glycolipid found in skeletal muscles.
 - D. is composed of alternating glucose and galactose molecules.

Bloom's: Remembering

59. An example of a monosaccharide is
- A. maltose.
 - B. sucrose.
 - C. glucose.**
 - D. glycogen.

Bloom's: Remembering

True / False Questions

60. Glucose is stored as a polysaccharide to prevent osmosis of water into the cells.
TRUE

Bloom's: Remembering

Multiple Choice Questions

61. Which of the following is NOT a disaccharide?

- A.** fructose
- B. sucrose
- C. maltose
- D. lactose

Bloom's: Remembering

62. Which of the following polysaccharides cannot be digested by animals themselves?

- A. glycogen
- B.** cellulose
- C. starch
- D. All of these can be digested by animals themselves.

Bloom's: Remembering

True / False Questions

63. Unsaturated fatty acids contain more hydrogen atoms than saturated fatty acids of the same length.

FALSE

Bloom's: Understanding

64. Rapid, uncontrolled hydrolysis of body fats can result in ketoacidosis.

TRUE

Bloom's: Understanding

65. Corticosteroids are a type of lipid commonly found in cell membranes.

FALSE

Bloom's: Remembering

66. Steroids are derived from cholesterol.

TRUE

Bloom's: Remembering

Multiple Choice Questions

67. In order to maintain proper health, total dietary fat intake should not exceed _____ of total dietary energy intake.

- A. 10%
- B. 20%
- C. 30%**
- D. 40%

Bloom's: Remembering

68. Which of the following is NOT a type of lipid?

- A. prostaglandins
- B. triglycerides
- C. cholesterol
- D. glycogen**

Bloom's: Remembering

Chapter 02 - Chemical Composition of the Body

69. Lipids containing glycerol would include _____ and _____.
- A. triglycerides, steroids
 - B. prostaglandins, phospholipids
 - C.** triglycerides, phospholipids
 - D. steroids, prostaglandins

Bloom's: Remembering

70. _____ are liver synthesized derivatives of free fatty acids that can be used as an immediate source of energy by many organs.
- A. Glycerols
 - B.** Ketone bodies
 - C. Steroids
 - D. Cholesterols

Bloom's: Remembering

71. _____ are fatty acids with a cyclic hydrocarbon group.
- A. Triglycerides
 - B.** Prostaglandins
 - C. Proteins
 - D. Carbohydrates

Bloom's: Remembering

72. This group of organic compounds acts as surfactants:
- A. carbohydrates
 - B.** phospholipids
 - C. nucleic acids
 - D. prostaglandins

Bloom's: Remembering

Chapter 02 - Chemical Composition of the Body

73. In the formation of triglycerides,
- A. hydroxyl and carbonyl groups interact.
 - B. amino and carbonyl groups interact.
 - C. carboxyl and amino groups interact.
 - D.** carboxyl and hydroxyl groups interact.

Bloom's: Remembering

74. Unsaturated fatty acids
- A. contain one or more double bonds.
 - B. are usually liquid at room temperature.
 - C. contain a maximal number of hydrogen atoms.
 - D.** Both contain one or more double bonds and are usually liquid at room temperature are correct.

Bloom's: Remembering

75. Phospholipids
- A. are glycolipids originally isolated from the prostate gland.
 - B. are major components of the cell membrane.
 - C. have a polar head and a nonpolar tail.
 - D.** Both are major components of the cell membrane and have a polar head and a nonpolar tail are correct.

Bloom's: Remembering

76. Ketosis
- A.** occurs when stored fats are rapidly degraded by the body.
 - B. stimulates an increased blood pH.
 - C. may lead to alkalosis.
 - D. occurs as the concentration of ketones in the urine decreases.

Bloom's: Understanding

77. Which of the following describes a trans-fat?

- A. Has carbon-carbon single bonds.
- B.** Has carbon-carbon double bonds with hydrogens on opposite sides of the bonds.
- C. Has carbon-carbon double bonds with hydrogens on the same side of the bonds.
- D. The fatty acids form a bent chain.

Bloom's: Remembering

78. Which of the following is NOT true of steroids?

- A. They have three 6-carbon rings joined to one 5-carbon ring.
- B. They contain a variety of functional groups.
- C.** They are derived from palmitate.
- D. They differ in the position of the double covalent bonds between the carbon atoms in the rings.

Bloom's: Remembering

79. Which of the following is NOT a derivative of cholesterol?

- A. corticosteroids
- B. vitamin D₃
- C. aldosterone
- D.** lecithin

Bloom's: Remembering

True / False Questions

80. All amino acids contain carboxyl and amino groups.

TRUE

Bloom's: Remembering

81. The specific sequence of amino acids in a polypeptide is known as the primary protein structure.

TRUE

Bloom's: Remembering

82. The white part of a cooked egg is due to denatured albumin proteins.

TRUE

Bloom's: Understanding

Multiple Choice Questions

83. _____ is a structural protein found in tendons and ligaments.

- A.** Collagen
- B. Keratin
- C. Myosin
- D. Fibrin

Bloom's: Remembering

84. Peptide bonds are formed by the process of

- A. ketosis.
- B. hydrolysis.
- C.** dehydration synthesis.
- D. aromatization.

Bloom's: Understanding

Chapter 02 - Chemical Composition of the Body

85. The secondary structure of proteins is/are
- A. the linear arrangement of amino acids in the molecule.
 - B.** alpha helix coils and beta-pleated sheet folds of a protein strand.
 - C. due to the interaction between protein subunits.
 - D. stabilized when a protein is denatured.

Bloom's: Remembering

86. The primary structure of proteins is/are
- A.** the linear arrangement of amino acids in the molecule.
 - B. alpha helix coils and beta-pleated sheet folds of a protein strand.
 - C. due to the interaction between protein subunits.
 - D. stabilized when a protein is denatured.

Bloom's: Remembering

87. The subunit of protein is the
- A. fatty acid.
 - B. nucleic acid.
 - C.** amino acid.
 - D. carboxylic acid.

Bloom's: Remembering

88. How many different amino acids are known?
- A. 10
 - B. 25
 - C. 30
 - D.** 20

Bloom's: Remembering

89. What holds a protein in its tertiary structure?

- A. hydrogen bonds between nearby amino acids
- B. weak chemical bonds between widely spaced amino acids
- C. disulfide bonds between sulfur groups on cysteines
- D.** Both weak chemical bonds between widely spaced amino acids and disulfide bonds between sulfur groups on cysteines are correct.

Bloom's: Remembering

True / False Questions

90. Proteins that combine with other molecules are said to be condensed.

FALSE

Bloom's: Remembering

91. The specific shape of a protein determines its function.

TRUE

Bloom's: Understanding

Multiple Choice Questions

92. A protein that is combined with another type of molecule like a carbohydrate is

- A.** conjugated.
- B. denatured.
- C. hydrolyzed.
- D. complemented.

Bloom's: Remembering

93. Which of the following is NOT a function of proteins in the body?
- A. carriers for membrane transport
 - B. enzymes
 - C. compose genes**
 - D. receptors for regulator molecules

Bloom's: Understanding

94. Keratin and collagen are considered _____ proteins.
- A. functional
 - B. structural
 - C. fibrous
 - D. Both structural and fibrous are correct.**

Bloom's: Remembering

True / False Questions

95. In DNA, cytosine forms a complementary base pair with adenine.
FALSE

Bloom's: Remembering

Multiple Choice Questions

96. The nitrogenous base adenine is a
- A. purine.**
 - B. pyrimidine.
 - C. steroid.
 - D. prostaglandin.

Bloom's: Remembering

Chapter 02 - Chemical Composition of the Body

97. Which of the following is NOT a component of DNA?

- A. phosphate
- B. deoxyribose sugar
- C. guanine
- D.** uracil

Bloom's: Remembering

98. The human genome refers to

- A. all living human beings.
- B. the total variations in human cells.
- C.** all of the genes in the cell.
- D. human mutations caused by gene defects.

Bloom's: Remembering

99. The "spiral staircase" structure of DNA is referred to as the

- A. tertiary structure.
- B. spiral structure.
- C.** the double helix.
- D. the twist of life.

Bloom's: Remembering

100. Which of the following is NOT one of the three types of RNA?

- A.** dRNA
- B. tRNA
- C. rRNA
- D. mRNA

Bloom's: Remembering

Chapter 02 - Chemical Composition of the Body

101. The base that is NOT found in RNA is

- A.** thymine.
- B. guanine.
- C. cytosine.
- D. uracil.

Bloom's: Remembering

102. Which of the following is NOT a difference between DNA and RNA?

- A. They have different sugars.
- B. RNA is a single strand, while DNA is a double strand.
- C. DNA has thymine, while RNA has uracil.
- D.** They both can leave the nucleus to perform their functions.

Bloom's: Remembering

103. The backbone of a DNA molecule is a chain of

- A.** alternating deoxyribose sugar and phosphate.
- B. alternating phosphate and nitrogen.
- C. alternating nitrogenous bases.
- D. alternating deoxyribose and ribose sugars.

Bloom's: Remembering